further that this was accomplished without any fusion of the metal under pressure. The fact that the resulting masses were true alloys he sought to demonstrate by showing that, if the metallic powders were correctly proportioned, the resulting metal showed the low melting-points of fusible alloys and eutectics. Unfortunately the aid of the microscope was not called in for the study of these "alloys," and, indeed, the greater portion of Spring's researches were carried out before the modern methods of metallography were available, but it has since been shown that the compressed masses of solid metal produced by Spring consisted of the practically unaltered particles of the original powder, simply welded together under the action of the pressure, but without the formation of those structural constituents of the corresponding true alloys. The low melting-points of such mixtures must be attributed to local action at the boundaries of the constituents and the rapid diffusion following the appearance of liquid metal at these points. Although, therefore, Spring's original conclusions were not entirely confirmed by subsequent research, his work has borne much fruit; his demonstration of the possibility of extruding bismuth in the form of thin wire shed new light on the whole question of brittleness and plasticity, and has largely contributed to the development of the modern processes of extruding metals and alloys for industrial purposes.

Spring's activities were not confined to the physical chemistry of metals, however, but extended to researches on the colour of sky and water and on colloidal solutions—to mention only a few of the other sides of his work. It is even claimed for Spring by his friends that in his researches on turbid media he anticipated the "ultra-microscope" in principle to such an extent that the apparatus he describes differs from that now in use only in regard to the power of the microscope employed.

The sum-total of the late Prof. Spring's researches constitute a monument of a life of intense scientific activity, and it may be hoped that these researches may now be gathered together so as to make them more readily accessible, and thus to secure for them the full recognition which they deserve.

NOTES.

The German Emperor has conferred upon Sir William Ramsay, K.C.B., F.R.S., president-elect of the British Association, the order "Pour le Mérite."

We notice with regret the announcement of the death, on August 18, at eighty years of age, of Mr. S. H. Burbury, F.R.S., distinguished by his work in mathematical physics, especially in the theories of electricity and magnetism and the kinetic theory of gases.

A Reuter message from St. Petersburg states that the Minister of the Interior has prohibited for the year 1911 the trade in marmots along the Eastern Chinese Railway, and also the forwarding of marmot skins, flesh, and fat by rail. This measure has been taken as a precaution against pneumonic plague.

The divisions of vertebrate and invertebrate palæontology and palæobotany in the U.S. National Museum have been combined, we learn from *Science*, into a new division of palæontology, with Dr. R. S. Bassler as curator in charge, Mr. J. W. Gidley as assistant curator of fossil mammals, and Mr. C. W. Gilmore as assistant curator of fossil reptiles.

It is officially announced that the Governor of British Guiana has reported the adoption, as from August 1, of maritime time, which is standard time four hours slow on Greenwich time. The same standard time has been adopted in the island of Granada, as from July 1, the effect being to put back the local time of that colony by seven minutes.

It is surprising at the present day, when the system of time-reckoning by reference to standard meridians is being adopted throughout the civilised world, that the city of Canterbury seems determined to maintain its own local time. The Dean and Chapter, in mediæval spirit, refuse to recognise any such "modern innovation" as Greenwich time, and have recently distributed cards intimating that the time observed in Canterbury Cathedral is 4½ minutes ahead of Greenwich time. The post-office and railway clocks are kept to Greenwich time, and the others anywhere between that and the cathedral clock. The resulting confusion has induced Mr. A. Lander, of 17 High Street, Canterbury, scientific instrument maker, and secretary of the East Kent Natural History Society, to make an electric clock which is kept to standard time by means of the wireless time signal from the Eiffel Tower. The first of the three time signals is received on Morse tape travelling at the rate of half an inch per second, and the half-minute contacts of the electric clock are also recorded on the same tape, so that the rate of the clock can be accurately determined. The second signal is utilised to correct the pendulum of the master clock, and the third signal is again received on the tape to show that the clock is exactly correct. This master clock works a number of clocks and instruments on Mr. Lander's premises, such as a rain-gauge, sunshine recorder, barograph, and also a large dial in the shop window, and drops a time-ball exactly at each standard hour.

The twenty-second annual general meeting of the members of the Institution of Mining Engineers will be held at Cardiff on Wednesday, September 13, under the presidency of Dr. J. B. Simpson. The following papers will be read, or taken as read:—the reduction, control, and collection of coal-dust in mines, S. Mavor; a rope-driven coal-cutter, W. Maurice. A number of papers which have already appeared in the Transactions of the institution will also be open for discussion.

The death has occurred, in his seventy-second year, of Dr. J. P. Schweitzer, who was connected with the University of Missouri from 1872 to 1906 as professor first of chemistry and later of agricultural chemistry. He was a native of Berlin, and after studying at Göttingen was for a time assistant to Heinrich Rose at Berlin. He went to America in 1865, and held posts at the polytechnic institute of Philadelphia and the Columbia School of Mines before receiving his Missouri appointment.

A remarkable crystal of aquamarine was described by Dr. G. F. Kunz before the New York Academy of Sciences on April 3. It was discovered by a miner on March 28, 1910, in a pegmatite vein at Marambaya, near Arassuahy, on the Jequitinhonha River, in Minas Geraes, Brazil. Its colour was greenish-blue, its form a slightly irregular hexagonal prism terminated at both ends by flat basal planes, its length 48·5 cm. and width from 40 to 42 cm., and its weight 110·5 kg., and its transparency was so perfect that it could be seen through from end to end. It is estimated that 200,000 carats of aquamarines of various sizes could be cut from it.

Mr. J. Allan Thomson, who has been appointed palæontologist to the Geological Survey of New Zealand, was the first New Zealand Rhodes scholar at Oxford, where he was also Burdett-Coutts scholar. He received his university training in geology and palæontology both in New Zealand and at Oxford, but for the last five years or so his work has been mainly in the direction of petrology. The New Zealand Geological Survey possesses more than one hundred thousand fossils from various horizons, but little appears to have been done hitherto to describe them or to make them available for study. It is hoped that now the survey has appointed a palæontologist on its staff the specimens will be properly described and arranged.

AT the 1909 meeting of the International Mathematical Congress, held at Rome, the subject of mathematical teaching was brought forward, and upon the initiative of Prof. D. E. Smith, U.S.A., it was decided to form an International Commission on the Teaching of Mathematics, this commission to report to the next triennial meeting of the congress, which will be held at Cambridge (England) in 1912. The commission will meet at Milan on September 18–20 of this year to take stock of the work done so far. As regards the United Kingdom, the work of collecting and issuing reports has been taken up by the Board of Education, which has appointed as delegates Sir George Greenhill, Prof. E. W. Hobson, and Mr. C. Godfrey. A number of reports have already been issued (Wyman, price 3*d.* each), and when the international series is complete it will form the most valuable collection of material at present available for the use of teachers of mathematics. The central committee consists of Prof. F. Klein (Göttingen), Sir G. Greenhill (London), and M. H. Fehr (Geneva).

IT is announced in *Science* that the Nantucket Maria Mitchell Association offers an astronomical fellowship of 200*l.* to a woman, for the year beginning June 15, 1912. The year will be divided into two periods. June 15 to December 15 will be spent on Nantucket, where the observatory is equipped with a five-inch Alvan Clark telescope, and this period will be occupied in observation, research, or study, and in lectures or instruction. February 1 to June 15, 1913, will be spent at one of the larger observatories, and the time occupied in original research and study. Every fourth year the fellowship will be available during the entire year for study at one of the larger observatories in Europe or America. The fellowship will be awarded annually, but in order that the work at Nantucket may be combined advantageously with the work at the selected observatory, the preference will be given to the same candidate for three successive years. A competitive examination will not be held. The candidate must present evidence of qualifications, giving an account of previous educational opportunities and training, and of plans for future work, as well as examples of work already accomplished. Application for the year beginning June 15, 1912, should be made, before March 1, 1912, to Mrs. Charles S. Hinchman, 3635 Chestnut Street, Philadelphia, Pa., from whom full particulars can be obtained.

THE long drought has been brought to a termination, and the excessive temperature which has continued with such persistence over England has given place to more normal conditions. The anticyclone which has so long been centred over our islands and their immediate neighbourhood has given way to shallow cyclonic disturbances which have arrived over us from the Atlantic. At Greenwich there was no rain from August 2 to August 18, and the aggregate fall from July 1 to August 18 was 0·32 inch, which fell on four days. Copious rains have, however, now fallen over London, and on three successive evenings, August 19, 20, and 21, sharp thunderstorms were experienced. On August 22 the highest temperature in London was 68°, which is the lowest maximum reading since July 2, a period of more than seven weeks. The disturbances which occasioned the recent thunderstorms over England were moving away to the eastward of our islands, and an anticyclone, centred in the Atlantic, was extending to our area. This change in the general conditions is likely to occasion a return of the fine weather with a gradual increase of temperature, although it is improbable that the temperature will be so high as that recently experienced. The summary of the weather for the week ending August 19 issued by the Meteorological Office shows that the mean temperature for the period was from 6° to 7° in excess of the normal over the entire kingdom, except in the north and east of Scotland and in the north-east of England; the excess of temperature, however, was not so great as in the preceding week.

MR. D. E. HUTCHINS, Chief Conservator of Forests, British East Africa, after ten years' forest service in India, twenty-three in South Africa, and four in Equatorial Africa, has now retired on pension. It fell to his lot both in South Africa and in Equatorial Africa to demarcate and arrest the further destruction of large areas of the beautiful extra-tropical forest that extends with but little change from the extreme south of Africa along the eastern highlands to the equator. As the latitude decreases the altitude increases. The forest that occurs at sea-level in the Knysna district of the Cape, at 3000, 4000, and 5000 feet in Natal and the Transvaal, is seen at an elevation of 7000 to 10,000 feet under the equator. The distribution of this forest is governed by the topography and rainfall of the highlands. There are wide gaps in its extension along the highlands. As one goes north, it changes somewhat in species, though but little in character. It is seen at its best on the equatorial highlands in what is now British and German East Africa. Here the trees grow with greater vigour than in the south, and the forest is enriched by the addition of a very valuable timber, the pencil cedar of Abyssinia (*Juniperus procera*). The preservation of this forest is of national importance to Africa, especially to extra-tropical Africa, the White Man's heritage; for it is a forest resembling that of the Nilgiri Shola forest of India, a forest with a dense couvert and slow-growing—the ideal water-holding forest. As a fact, it is a forest from which streams of water flow on every side, perennial streams that feed the rivers when they are most wanted. The future of this forest is assured in South Africa, the bad forestry of Natal having happily come to an end with Union. The Germans are preserving it carefully in German East Africa, no forest of this class having been alienated since 1900. But in British East Africa there hangs out a danger signal! The Colonial Office will have to see that its forest policy there is duly upheld. There is a danger that settlement, so right and necessary, in a new country may be pushed too far, to the ruin of the most valuable public assets of the country—its water and timber. Settlement is obviously the first requisite; but settlement must not be allowed to touch an acre of highland forest in a country where the forest area is only 1½ per cent. of the total area, and that is the position in British East Africa.

A SPECIAL "tuberculosis" number of the Bulletin of the Johns Hopkins Hospital has been issued (vol. xxii., No. 245). The principal article is on stereoscopic X-ray examination of the chest, with special reference to the diagnosis of pulmonary tuberculosis, by Drs. Dunham, Boardman, and Wolman. It is illustrated with three excellent stereoscopic views of the condition present in three cases of pulmonary tuberculosis.

WRITING from Chinanfu, Shantung, China, Mr. Alfred Tingle refers to a statement made in a note in NATURE (June 8, p. 493) that "rice in China takes the place of wheat with us as the chief source of starchy food," and points out that in Shantung rice is little used, other cereals being substituted, and that the diet is a liberal one. The statement, of course, was only a general one; and obviously in a country so huge as China, with climates varying from tropical to almost Arctic, the diet in different districts must be equally variable.

IN a paper on the chemical differentiation of species, Miss Muriel Wheldale suggests that the presence of particular chemical compounds in plants may be of value either in the differentiation of, or in accentuating resemblances between, orders, families, genera, or even species. Thus the glucoside "aucubine" was first isolated from *Aucuba japonica* (Cornaceæ), and subsequently from seven species of Garrya, another genus of the Cornaceæ. It is also stated to be present in various species of Plantago (Plantaginaceæ). It would be interesting to discover if there are other connecting links between these two groups. Some of the purins are known only in the genus Thea (*Bio-Chemical Journal*, v., 1911, No. 10, p. 445).

IN his report on the Giza Zoological Gardens for 1910 Captain Stanley Flower states that the number of visitors continues to show a gratifying increase, and that the number of animals, other than fishes, in the collection is larger than in any previous year, comprising at the annual stock-taking 1464 specimens, referable to 391 species. Among the more important additions were a rhinoceros and a Blue Nile elephant.

IN *The Field* of August 12 Mr. R. I. Pocock illustrates the different ways in which the Indian and the African elephant use the tip of their trunks. In the former, some small object, such as a handful of bran, is held by the tip of the trunk being bent on itself, so that the object is squeezed between the tip and the lower surface of the trunk, whereas in the latter the object is held between the two lips of the trunk-tip, much after the fashion in which fruit is placed in a cornucopiæ.

THE recorder of Section D (Zoology) of the British Association sends us the following provisional programme of the section for the forthcoming meeting at Portsmouth:—Presidential address, Prof. D'Arcy W. Thompson. *Discussions:* On the origin of the Mammalia, Prof. G. Elliot Smith, Dr. C. W. Andrews, Prof. A. Keith, and Dr. Marett Tims; on Wallace's line, C. Tate Regan and Guy Marshall; on the systematic position of the cyclostomes, Dr. Woodland, Prof. Dendy, and E. S. Goodrich; on the nutrition of marine organisms, Dr. Dakin, Prof. Herdman, Prof. Gamble, and Prof. V. H. Blackman. *Lectures* (with illustrations): Mr. F. Enock, on fairy flies; Dr. C. W. Andrews, on the extinct reptiles of the Oxford Clay of Peterborough. *Papers:* Recent advances in sex problems, G. Smith; some points in the anatomy of Squilla, Dr. Woodland; new species of Balanus collected by the *Siboga* in the Malay Archipelago, Dr. P. P. C. Hoek; a new epizoic hydroid on a copepod (n.g.+n.sp.) parasitic on *Scopelus glacialis*, Prof. H. Jungersen; note on the manus of a young Indian elephant, Prof. R. J. Anderson; some points in the manus and pes of Primates, Prof. R. J. Anderson; on the effect of Sacculina on the fat metabolism of its host, G. C. Robson; notes on a trypanosome found in a sheep tick, and its probable connection with the disease known as louping-ill, Major C. F. Bishop, R.A.; on the dorsal vibratile organ of the rockling (Motella), Dr. J. Stuart Thomson; momentum in evolution, Prof. Dendy; Polytrema and its allies, Prof. S. J. Hickson; the life-history and metamorphosis of Murænoids, Dr. J. Schmidt (Copenhagen); le cycle animal des glandes génitales de l'*Echinocardium cordatum*, Prof. Caullery (Paris); the hypostome and antennæ in a reconstructed trilobite (Calymene), Prof. Malcolm Laurie; (1) the vernal-plumage changes in the adolescent blackbird (*Turdus merula*) and their correlation with sexual maturity; (2) case of a remarkable egg of *Falco tinnunculus* laid in remarkable circumstances, Prof. C. J. Patten; (1) the lantern of Aristotle as an organ of locomotion; (2) solaster development, Dr. James F. Gemmell.

MESSRS. FRIEDLANDER, of Berlin, have conferred an inestimable benefit on zoologists and palæontologists by the issue of a second edition of the "Zoologischer Adressbuch" (International Zoologist's Directory), which contains the names and addresses, so far as they could be ascertained, of all living persons specially interested in zoology, anatomy, physiology, and animal palæontology throughout the world, together with taxidermists and natural history dealers. The previous edition was published by the German Zoological Society in 1895, to which a supplement appeared in 1901. The present volume comprises 1109 pages, of which 88 are devoted to the index of names. As in the American "International Scientist's Directory," the names of the persons referred to are entered under the heading of their respective countries, but in place of the names being arranged in alphabetical order, they are classified according to the place of residence. Whether this is an improvement or the reverse we do not propose to discuss; but, whatever may be the general opinion on this point, the index renders it perfectly easy to find the individual addresses. Taking the British Isles as a sample of the whole, we find, so far as we are acquainted with them, both the names and the addresses entered with what is really marvellous accuracy. The names of a few deceased naturalists, such as the late T. Southwell and C. J. Cornish, are retained on the lists, while a few living naturalists, *e.g.* Mr. Hugh Gladstone, are omitted; and we notice some confusion between the officials of the Victoria and Albert Museum and those of the Science Museum. Errors of this nature are, however, practically unavoidable, and the publishers are to be heartily congratulated on the manner in which they have carried out an arduous task. As the expense in producing the work must have been very heavy, it is to be hoped that they will receive liberal support from that section of the public interested in natural history.

IN the current issue of *Scientia* M. J. Costantin directs attention to some of the recent phases of the culture of orchids. He points out that 600 hybrids have been produced in the genus Cypripedium alone, many of which do not resemble their parents but look like new species, and are indefinitely fertile, and so can be crossed with each other. Observations are added on the association with orchids of a mycorhiza, three species of which have been recorded; one of these is found in the roots of Cypripedium, Cattleya, and Lælia, another in Phalænopsis and Vanda, and the third in Odontoglossum. The inoculation of an orchid with a species of mycorhiza other than that usual to it leads to one of three results: either the plant dies, the fungus dies, or they become accommodated to each other; but in this case a plant of unusual form is produced. The author suggests that these facts indicate that the environment may be responsible for the appearance of new characters.

PROF. EMIL ROHDE (in *Zeitschr. f. wiss. Zool.*, Bd. xcviii., 1 Heft) shows that chromatin diminution occurs in various tissues other than the germ cells. In the blood cells of various vertebrates the nuclei undergo a maturation process similar to that exhibited in oogenesis, portions of chromatin being cast out of the nucleus and out of the cell. In the red blood cells of mammals this process goes on to such an extent that the whole nucleus is lost. The nuclei of other tissue cells, especially those of the central nervous system of vertebrates, exhibit diminution of chromatin which the author compares with that observed in spermatogenesis. The nuclei of the nerve cells in karyokinetic division give off spherical masses of chromatin, which later lie between the resting nuclei. In other cases the nucleus breaks up into several small daughter nuclei, which Prof. Rohde compares with the division of the sperm mother cell into spermatozoa. The fact that diminution of chromatin takes place in so many different tissues and animals (those investigated range from Mustelus to man) indicates that it has a general significance; the author regards it as a characteristic of adult, that is, of maturing and dividing cells in general. Other memoirs in the same journal deal with the innervation and sense organs of the wings of butterflies and the nephridial funnels of earthworms.

To *The Journal of Economic Biology* for July Dr. H. B. Fantham contributes an important article on coccidiosis in game-birds and poultry. Owing, it is suggested, to the great increase of motor traffic, and the consequent pollution of the air in many parts of the country, white diarrhœa and other forms of coccidiosis, which chiefly affect young birds, appear to be on the increase, and there is, accordingly, urgent reasons that every available means should be taken for keeping them in check. The two important objects which should be kept in view are, first, the taking of such precautions as will tend to prevent the pollution of air and soil by coccidian oöcysts, and, secondly, to endeavour to raise the vitality of young birds, and thus enable them the better to resist the onset of the disease. In the case of domesticated poultry, cleanliness is a matter of the first importance, both as regards the young birds themselves and their surroundings; and it is probable that if such preventive measures were properly enforced and carried out, coccidiosis would eventually disappear. The author gives a full and detailed account of the structure and life-history of the parasite of coccidiosis and of its effects on the intestinal tract of its victims, but these are too long and too technical for quotation, even in brief abstract, on this occasion. *Eymeria avium*, or *Coccidium avium*, as it was formerly called, is a minute animal parasite belonging to that section of the Protozoa known as the Sporozoa, on account of the production of resistant spores. Although in some cases the whole intestinal tract of the bird may be riddled by the parasite, the duodenum and the paired cæca, or blind guts (especially long in grouse), are the parts chiefly attacked. The life-cycle of the parasite is complicated by the fact that there are two distinct phases of development, namely, an asexual phase, known as schizogony, during which there is a multiplication of the parasites by fission in the lining of the intestine of the infected bird, and subsequently a sexual phase, in which resistant cysts and spores adapted for life outside the body are produced in myriads. It is by these spores, which are swallowed by fresh birds with their food and drink, that the disease is spread.

THE difficulty of obtaining trustworthy data, at any rate in India, to prove or disprove the influence of forests on atmospheric and soil moisture is reasonably argued in an article appearing in *The Indian Forester* (July). Not the least interesting portion is the transcript of a note on the subject submitted to the Indian Government by Dr. Walker, the Director-General of Observatories. It reflects great credit upon the Government of India that, in spite of opinions mainly adverse, they assent to the initiation of a few experiments in selected localities for the purpose of tabulating information with respect to local differences in rainfall, temperature, and humidity inside and outside forest areas, as also to differences in level of the underground water table and extent of floods that might be referable to the proximity of forest areas.

AN account of the Percy Sladen Memorial Expedition (1910–11) to the Orange River through Little Namaqualand, contributed by Prof. H. H. W. Pearson, is appearing as a series of articles in *The Gardener's Chronicle.* In the current number (August 19) the author touches on the existence of a flora with a strongly marked Cape affinity occurring on the Khamiesberg range, while the low country shows entirely different vegetative formations, in which succulents predominate. The Khamiesberg is one vegetative island, while another is found on the Huilla plateau in South Angola, and possibly similar floras will be discovered on the unexplored peaks in German South-West Africa. If these islands show the remnants of a flora once continuous, whence, it is asked, and by what route, came the ancestors of the plants occupying the lowlands. The illustrations represent some of the more striking succulents, such as *Mesembryanthem digitiforme* and *Augea capensis.*

OWING to the receipt of numerous specimens of inflorescences from the graft hybrid, *Laburnum Adami*, sent to Kew Gardens for identification, Mr. W. J. Bean contributes a short article on the subject to *The Kew Bulletin* (No. 6), in which he explains how this particular novelty arose as a chance development from a graft of the dwarf purple broom, *Cytisus purpureus*, on the common laburnum. From the graft there arose a shoot which produced the intermediate type of purplish-yellow flower. Subsequently portions of trees propagated from the shoot reverted to the parent types, so that a single tree may bear at the same time the purplish flowers of the presumed hybrid, yellow flowers of the laburnum, and purple flowers of the broom. Two further examples of graft hybrids, *Crataego-mespilus Dardari* and *Crataego-mespilus Asnieresii*, are also described. They both arose on the same tree, a medlar grafted on a stock of common hawthorn, as branches showing composite characters. *Crataego-mespilus Dardari* has shown a tendency to break up into three forms, representative of the type *Asnieresii,* pure medlar, and itself. The different forms are illustrated from a photograph of three sprays gathered last June from a specimen of *Crataego-mespilus Dardari* growing in Kew Gardens.

IN the August number of *Petermann's Mitteilungen* Prof. Maurer describes a conventional projection for conveniently representing the lines of magnetic declination. For their study Mercator's projection is unsuitable, however well adapted it may be to the requirements of the navigator, since the areas in the neighbourhood of the poles are not represented, and the zones in higher latitudes are greatly distorted. In his projection the polar regions are well shown, the central point of the map being in $\phi = 0°$, $\lambda = 90°$ E. South America is considerably distorted from being unfavourably placed, but other continents suffer less.

THE Journal of the Meteorological Society of Japan for June contains original articles, with brief abstracts in English, (1) on the construction of protected rain-gauges, by Mr. J. Sato. The author gives the history of the works of some of the principal writers on this subject, and describes a gauge devised by himself, which is a modification of one adopted by the late Dr. Billwiller in the Swiss Meteorological Service. (2) An analysis by Mr. H. Maruoka of the Osaka seismogram at the time of the severe earthquake felt in Mexico on June 7. The time of its commencement in Osaka was 9h. 17m. 48s. (135th meridian); its total duration was 2h. 34m. 31s. in the E.-W. component, and 2h. 31m. 23s. in the other component. (3) Discussion of rainfall observations at Osaka for the years 1883–1910, by Mr. K. Yamada. The results of this valuable investigation are not given in English.

THE experiments of Profs. Boltwood and Strutt, and of Dr. Eve, on the amounts of uranium and radium present in radio-active minerals, have led to the conclusion that the ratio of the amounts of the two present is a constant independent of the nature of the mineral so long as its age was considerable. A long series of measurements made in Madame Curie's laboratory by Miss Ellen Gleditsch seem now to cast doubt on the constancy of the ratio. The methods used by Miss Gleditsch appear to offer little ground for criticism, and her results show a variation of the ratio of radium to uranium from $1{\cdot}8\times10^{-7}$ to $3{\cdot}7\times10^{-7}$ for the twenty-one minerals examined. These differences she is disposed to attribute to the existence of the long-period ionium and possibly another long-period element between the parent uranium and radium, but does not exclude the further possibility of the "constants" of radio-activity being influenced by external circumstances more than we at present believe.

THE sensation produced on the retina by a source of light of short duration has for the last three-quarters of a century been taken as proportional to the product of the intensity of the source into its duration. The early experiments of Talbot and of Swan, and the later ones of Bloch and of Charpentier, provided ample justification for the law so far as it related to sources of considerable intensity. In the *Journal de Physique* for July, MM. A. Blondel and J. Rey point out that for weak sources the intensities of which are not much greater than the lowest perceptible the statement cannot be true, or there would be no lower limit to perception. On this ground they argue that the sensation should be proportional to the product of the *excess* of the intensity of the source over the minimum just perceptible into the duration of the source, and this conclusion they have verified by means of the measurements made by seventeen observers by two independent methods of observation.

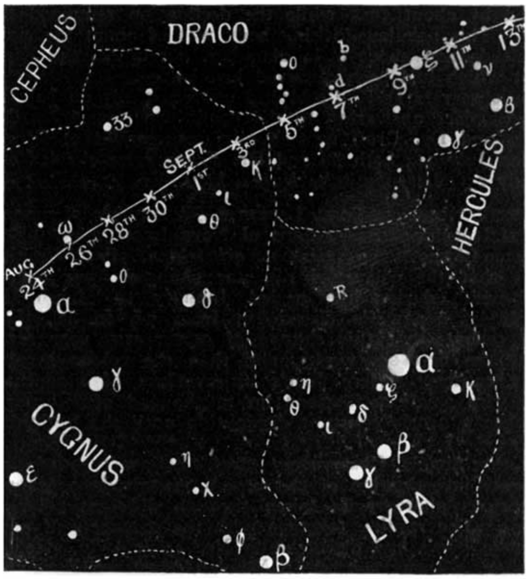
WE learn from *The Engineer* for August 11 that the new Italian Dreadnought *Conte di Cavour* was successfully launched at Spezia on August 10. Admiral Mirabello's crusade against lack of homogeneousness is beginning to produce its fruits; it is not likely that Italy will add to its armoured cruisers, as opinion has turned in favour of Dreadnoughts, of which four were designed by General Masdea. The *Conte di Cavour* is the second example of these. She will have a displacement of 21,500 tons, and her turbine machinery, of 24,500 horse-power, is designed for a speed of 22 knots. There will be twenty water-tube boilers of the Blechynden type. The normal coal and petroleum capacity will be 1000 tons. The armament will comprise thirteen guns of 305 mm., twenty guns of 120 mm., and thirteen guns of 76 mm. There will be three submarine torpedo tubes, two lateral and one stern.

A COPY of the "Reports and Transactions," for the year ending September 30, 1910, of the East Kent Scientific and Natural History Society has been received. Among much other interesting information contained in the report, some facts about salt rains, contributed by Mr. W. H. Hammond, may be mentioned. On December 14, 1910, a very heavy gale from the south-east with a deluge of rain in the night occurred; on the following day all the windows which faced south-east had quite a frosted appearance when dry. Some of the substance scraped off and dissolved in distilled water was proved to consist of common salt. At Milton Chapel some years ago, in the 'eighties, on one occasion a north-east window was coated with salt after a gale, and on the *Dane John* about the same time a salt gale was experienced; it made the young leaves look as if they had been scorched by fire. Mr. Hammond states that in 1871, when a student at the Royal Agricultural College, Cirencester, Prof. Church told his class that the rain which came in a gale one day from the direction of the Bristol Channel was loaded with salt; this must have travelled about sixty miles. The report also contains observations of the "nailbournes" in the Elham Valley, Petham, and Drillingore in the Alkham Valley, Dover. Useful meteorological statistics and notes for the year 1910 from various observing stations throughout east Kent are also included, as well as natural history notes and reports of lectures and addresses.

OUR ASTRONOMICAL COLUMN.

THE COMETS 1911*b* AND 1911*c*.—Numerous observations of the comets discovered by Kiess and Brooks, respectively, are now being recorded, but they contain nothing that is strikingly new; the Kiess comet is now invisible in these northern latitudes.

In No. 4517 of the *Astronomische Nachrichten* Prof. Pickering reports that a photograph of the spectrum of comet 1911*b*, secured with the 8-inch Draper telescope on July 7, shows the bands at λλ 3883 and 4737 as bright, and of nearly equal strength; the latter was much the brighter in the case of Daniel's comet, 1907*d*.



Apparent path of comet 1911*c* August 24–September 13, 1911.

From Mr. F. C. Leonard, of Berlamont, Mich., U.S.A., we have received a lengthy report of observations of both comets made during July. Kiess's comet developed appendages on both the preceding and following sides, and on July 26 a long streamer was seen to extend for some distance in a direction perpendicular to the axis.

Brooks's comet, observed on July 25, 26, 27, and 29, presented the mottled appearance of a condensed nebulous cluster, and was 3′ or 3·5′ in diameter.